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ABSTRACT

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LEARNING OPTIONS AND STUDENT ACHIEVEMENT: TEST OF A MODEL IN A LARGE URBAN COMMUNITY COLLEGE

INNER COLLEGE REPORT NUMBER 2

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INFORMATION

Miami-Dade Junior College, South
Department of Educational Research
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June 1971

ABSTRACT

Sixty-six students were enrolled in a combined Social Science-English experimental section which permitted them their choice of learning method. Options available were lecture, small group, programmed instruction, directed study and community involvement, and students were encouraged to try a variety of approaches. Six questions relating to achievement and retention rate were explored using both univariate and multivariate methods. Results indicated no significant differences between the experimental group and the control section. It was further pointed out retention rate was higher for the control section. Recommendations included consideration of the need to prepare students and teachers for this technique. Final considerations center around the need for further research.

INTRODUCTION:

The research described herein was intended to determine the feasibility of individualizing instruction in a large urban community college by permitting students their choice of learning method. This approach, sometimes referred to as aptitude-treatment interaction, has been suggested for some time by many researchers.

The basic objective of this study was to determine whether allowing students this choice would result in increased learning in Freshman English and Social Science. Sub-objectives included:

1: The development of a model for the teaching of Freshman English and Social Science in combination incorporating the use of learning alternatives, behavioral objectives, community involvement and diagnostic and prescriptive evaluation devices.

2: The development of materials (objectives, curricula, tests) and techniques which if found appropriate may be made available to other Social Science and English instructors.

3: To establish the "laboratory" concept on the campus so that new methodologies and materials in a variety of areas may be studied on a sample of students prior to more general adoption.

For the purpose of this investigation, five instructional modes were developed by this researcher and the instructional team* and placed within a structure which permitted students a choice of one

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*The instructional team consisted of Patricia Cline, Assistant Professor of English and James Wernert, Assistant Professor of Social Science. Both contributed much to the development of the Project.

mode per instructional unit. There were to be four units during the semester. The basis for this approach was first expounded for the Community College by Cohen (1970), and later piloted on an experimental basis by Greenberg (1970). Recently, Domino (1970) devised an experiment to test whether students taught in a manner "consonant" with their learning style would achieve more than a group deliberately provided with a mode opposite their learning style. His findings were mixed though he does report significant differences in achievement of factual material favoring students taught in a manner consistent with their measured achievement orientation.

The learning options available to students were as follows:

1. Lecture: This mode is characterized by teacher-dominated behavior for the purpose of imparting specific information with a minimum amount of pupil involvement.

2. Small Group: The primary activity here is frequent pupil-pupil, pupil-teacher interaction in which learning results chiefly from peer expressions, peer reactions and peer "involvement" with material.

3. Programmed Instruction: With this mode the student obtains information in isolation, removed from the classroom with material presented in small increments (frames) with frequent reinforcement provided.

4. Directed Study: The approach stipulates that under the guidance of the instructor in a one-to-one situation removed from the classroom, the student will pursue course objectives and outside interests using whatever material he and the instructor deem appropriate.

5. Community Involvement (Sensitivity Modules): This mode enables the student to participate in experiences (selected jointly by himself and his instructor) in the surrounding community in order to obtain first-hand impressions of various phenomena such as: housing deterioration, job market, church attendance patterns or racial bigotry among other possibilities he may develop. This experience is supplemented with a reading list supplied by the instructor and geared toward the weekly objectives.

The rationale for the first four options were Cohen's (1969) suggestions coupled with the experiences of the instructional team with former classes. The fifth option, community involvement, stemmed from a desire to bring willing students into contact with real issues where they might apply theoretical knowledge obtained from texts and lectures. This was the option where, it was felt, students clammering for relevance would find a vehicle to pursue their goals. Many of the specifics utilized with this mode were derived from Kirschenbaum (1970).

METHOD:

At registration, students seeking Freshman English and Social Science were told of the learning options experiment and were invited to enroll. There were no prerequisites for the course except a desire to take the two courses together. (Their alternative was the customary separate section of each.) Despite advertising, later follow-up revealed that most students enrolled knowing nothing about the experiment save the fact that the hour it was given was in keeping with their needs. In all, 66 were enrolled.

During the first week of classes the structure was explained. This was to be a team-taught venture with separate evaluation for English and Social Science. All students then experienced mini-versions of each option after they were presented with the objectives for what was known as "challenge" week. They were advised that beginning with the second week all instruction would be based on the objectives they would receive--in--writing--for the unit and that all instruction would be in their preferred mode which they could alter after the completion of a unit. Multi-modes were made possible by dividing the total number of minutes available into 4 portions for students choosing to remain in the classroom, as follows:

30 min. Activity 1: Intergrating Session (All students present) Team taught session in which interrelations between the courses is stressed. Format is flexible.

50 min. Activity 2: Students choose either:
Small Group English or Lecture Social Science

50 min. Activity 3: Depending on their choice above, students go to:
Lecture English or Small Group Social Science

30 min. Activity 4: (Optional) Personal conferences with instructional team for guidance with Programmed Instruction, Directed Study or Community Involvement option or any other assistance students may require.

The above schedule was based on two 160 minute meetings per week.

Grade requirements for English and Social Science were specified according to a system based on Bloom's taxonomy of educational objectives, (Bloom et.al, 1956). That is, "C" work required the lowest level functioning, as defined by the taxonomy, and higher grades required demonstration of higher level skills. Thus, at the unit's initiation, each student knew what had to be completed within 4 weeks (the length of a unit) to earn "A", "B", or "C". In the case of English, the "unit sheets" specified written or verbal presentations due at unit's end. For Social Science, the "unit sheet" described content to be contained on multiple choice and essay-type exam given at unit's end. The difference between the grades represented a student's growth from knowledge or recall level functioning for a "C" to application and evaluation for "B" and "A". All grades were tentative as students could, at any time, demonstrate higher order of ability and obtain an advanced grade. Incompletes were used for work not turned in or for work not meeting standards.

Throughout, students were encouraged to experiment with each option to seek the best combination of approaches for themselves.

DESIGN:

Since randomization to treatments was not feasible, a covariance analysis was employed utilizing students' scores on the verbal portion of the Florida Twelfth Grade Placement Test* as the covariate.

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* The Florida State-Wide Twelfth Grade Testing Program (FSWTG) developed by the Educational Testing Service is admisistered to all Florida students in their senior year in high school. Persons not tested in their high schools are examined by the college on a portion of the FSWTG. The college's residual testing program is optional for adult students, however, and many do not appear for testing even though requested. Thus FSWTG data are often incomplete.

Social Science short answer and essay results separately, for the experimental class were compared with the results on the same tests for another class (control) taught by the Social Science teacher in the traditional, (unimethod) manner.

A multivariate analysis of the covariance was therefore employed to bring data to bear on the following questions:

(1) Does providing learning options to students result in increased performance over a control group on tasks requiring lower cognitive domain functioning (the short answer test).

(2) Does providing learning options to students result in increased performance over a control group on tasks requiring mastery of higher cognitive domain skills (the essay test).

(3) Does the experimental approach result in a combination of lower and higher cognitive domain skill advantages to involved students (the multivariate case).*

Attitudinal data were also examined through utilization of a 17 item questionnaire designed by this researcher to elicit student feelings toward school, their professors, their fellow classmates and the general college atmosphere. By partitioning students at the median for their attitude test results (those above the median classified "high attitude toward school" and those below, "low attitude toward school") the following additional questions were considered:

(4) Is achievement within the experimental program related to students expressed attitude school?

(5) Is achievement within a particular learning mode related to students' expressed attitude toward school?

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*Both univariate and multivariate analysis of variance were completed utilizing the Manova program for large computers of D. J. Clyde.

(6) May a student's decision to withdraw from the experiment, (and/or from college entirely) be predicted on the basis of his responses to the attitude instrument?

Attitudinal data were gathered during Week II. Cognitive results are based on Units I and II.

RESULTS:

For Questions (1), (2), and (3)

The multivariate analysis of covariance was performed to compare experimental with control classes on each of the dependent variables, Social Science short answer and Social Science essay, having controlled for differences in verbal abilities between the two groups. This approach is useful when we cannot randomly assign subjects to treatments, a procedure which virtually assures equality of groups on all relevant variables. In the present circumstance, while equating for verbal ability, we have made mo adjustments for other differences which may exist.

Below are means and standard deviations for the groups before any controls are applied.

TABLE I

Means and Standard Deviations for Social Science Short Answer and Essay Tests plus FSWTG Scores.

		Short Answer		Essay Answer		Verbal FSWTG Aptitude
	N*					
Experimental Section	15	14.200	Mean	2.400	Mean	42.067
		1.656	S.D.	1.502	S.D.	24.391
Control	27	13.185	Mean	2.407	Mean	41.667
		2.815	S.D.	1.118	S.D.	18.684

*The lowered N reflects missing FSWTG scores.

TABLE II

Means and Standard Deviations after FSWTG controls applied.

		Short Answer		Essay Answer	
Experimental Section	15	14.193	Mean	2.396	S.D.
Control	27	13.189	Mean	2.409	S.D.

As the very slight differences between the tables would indicate, neither the univariate nor the multivariate test of the significance of the difference between the groups were significant. The summary tables below reveal that the first three questions of the study must be answered in the negative:

TABLE III

F-ratio between Experimental and Control Classes with Dependent Variables of the Social Science Short Answer and Essay Test. Univariate and Multivariate Case.

UNIVARIATE CASE

Variable	F (1,39)	Mean sq.	P. Less than
Short Answer	1.638	9.716	0.208
Essay Answer	0.001	0.002	0.974

MULTIVARIATE CASE

F.	P. Less than
1,156	0.325

For Questions (4) and (5)

Data from Unit I and the attitude questionnaire were analyzed with a 2x2 factorial analysis of variance design using attitude and option choice (small group or lecture) as independent variables. The levels consisted of high and low attitudes (as defined above) for the first independent variable and lecture and small group for the option choice independent variable.

For this group, Unit I English grades were used (4 point scale) along with results of the Social Science short answers for the Unit providing the entries for the table on the page which follows.

TABLE IV

SUMMARY STATISTICS FOR TEST OF DIFFERENCES WITHIN EXPERIMENTAL SECTION

DEPENDENT VARIABLE	OPTION/COMBINATION*	M	SD	RESULT OF MANOVA	F
English Grade	1	2.889	.782	Attitude	1.091
	2	3.333	.707	Option	.392
	3	2.889	.928		
	4	3.000	1.414	Option x attitude	.188
Social Science Grade	1	70.000	12.990	Attitude	2.001
	2	65.000	12.816	Option	.270
	3	72.667	8.456		
	4	58.500	31.820	Option x Attitude	.593

MULTIVARIATE CASE

DEPENDENT VARIABLES CONSIDERED JOINTLY	Attitude	2.134
	Option	.459
	Attitude x Option	.305

* 1 small group-high attitude
2. small group-low attitude
3 lecture-high attitude
4 lecture-low attitude

None of the F-tests were significant, univariate or multivariate, indicating that within the experimental group there were no differential effects on the English or Social Science achievement or in achievement in some combination of the two, owing to student attitude, learning option choice or an interaction between the two. Examining the means reveals that regardless of learning option chosen, students in the category "high attitude toward school" scored higher in Social Science than did the "low attitude" students, while the reverse was true for English (through, as indicated above, none of the differences were significant).

For Question (6)

A 17-item Likert -type attitude questionnaire was administered to 47 students in the experimental section during the second week of the 15 week semester. Nine of the items were positive statements on college life (e.g. "The professors tend to treat students with respect-there is an air of understanding about them," "The beautiful architecture of the campus is matched by the beautiful people you meet here," etc.) The remaining eight items were negative (e.g. "The size of the college prevents the making of real friendships," "I think I'd be happier working full-time or attening another college," etc.) All items were scored so that the most favorable response possible was worth "5", the next most favorable response was worth "4" continuing with "3" for a neutral response and a "1" for the most negative response. Thus, the possible range was 17-85 with 51 the neutral point.

By the close of the semester, the following differences in completion rate appeared between students with high and low attitudes toward the college:

Percent Completing Course With Credit Earned

		Social Science	English
Highest Ten Scorers	(Mean = 73.8)	80	60
Lowest Ten Scorers	(Mean = 51.3)	40	30

These findings are in the predicted direction though a chi-square test revealed independence-, or no significant relationship, between high and low scoring on the instrument and whether one passed the course.

DISCUSSION:

The analysis fails to reveal any cognitive advantages for the experimental section. Recall level (lowest of the cognitive domain) material as well as evaluation level material are mastered equally by the two groups.

For those within the experimental section who completed the course there arose high positive attitudes toward the program and a willingness to learn by experimentation with new modes. These students clearly want the program to continue and see in their fellow classmates withdrawal an indication of their lack of commitment to assume responsibility for their own learning. The students who remained suggested the program be continued on a selective basis with students successful with the methodology in the past doing the screening and interviewing of prospective enrollees.

Examination of the following data on retention rates reveals further evidence of the need to carefully consider the question of for whom the experiment is most appropriate:

	Initial Registration	Number Completing Course With Credit		Percent of initial registration completing the course with credit	
		S. Sci.	Eng.	S. Sci.	Eng.
Experimental Section	66	32	30	48	45
		S. Sci.		S. Sci.	
Control Section	87	59		68	

Certainly the failure of so many students from the experimental section to finish the course with credit is a cost factor which must be considered.

The finding that the attitude instrument may discriminate between "withdrawers" and "persisters" may prove to be most useful, as it verifies previous findings of other researchers (Bryan and Erickson, 1970; Cohen and Brawer, 1970; MacMillian, 1970). It probably will be advantageous to consider its use in connection with several other measures of a cognitive nature, to produce a more valid prediction. (Linear discriminant analysis appears as the appropriate statistical device for prediction in this case.) As attrition is of college-wide concern, this development will be carefully pursued.

CONCLUSION:

It was assumed, as this project was initiated that individualization of instruction required provisions for many learning modes. In fact, it was felt that the current student movement and its demands for greater freedom of choice in methodology and curriculum

would only hasten the move toward making alternatives available. While this research and prior data from earlier work in this area gathered by this writer clearly reveals the feasibility of the approach for some students, that this is an appropriate course of action for all community college students must now be seriously questioned. Who should participate and how they should be chosen must await future research. It seems clear, however, that while providing students with greater freedom of choice and fewer "housekeeping" types of responsibilities is theoretically sound, its successful implementation requires a retraining process for both students and their teachers. The former need time to develop intrinsic motivation (once the extrinsic threats are removed) and perhaps should be permitted a transition phase so the conversion may be facilitated. Some students will continue to require the regimentation their earlier schooling adjusted them to and, as such, will not be able to cope successfully in the freer atmosphere. Their teachers require support services to assist in the preparation and collection of the varied materials this approach requires of them, to help in the counseling of their students, and to train them in developing and using statements of objectives.

In the meantime Gagne's observations (in Tyler, 1967, p. 37) may provide an alternative explanation of the failure of so many students to complete the program:

> Many speculations have been made regarding the existence of differences of 'learning styles,' 'learning approaches,' and 'learning strategies' among individual learners. Such differences are so evidently and heartily wished for that one almost believes they exist. Yet the

> fact of the matter seems to be that almost none are verified realities (cf. Gagne, 1966). There has been a rather lengthly history of discouraging research in this area (Woodrow, 1946).

In short, it may be that those variables most crucial for student success do not include provisions for accommodating differences in student learning style. Continuing this program with selected students may serve to resolve the issue.

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